



KEMENTERIAN PENGAJIAN TINGGI



PROJECT TITLE:

RICE VERTEILER

JABATAN: JABATAN KEJURUTERAAN MEKANIKAL

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CHAPTER 1 (INTRODUCTION)

1.1 RESEARCH BACKGROUND

Rice has fed more people than any other crop has for thousands of years. The ancient Indian name for rice, Dhanya, means "sustenance for the human race." Especially in much of Asia, life without rice has been unthinkable. Rice feeds more than half of the world population, but most rice is consumed within ten miles of where it is produced.

Rice is the second largest crop in planting acreage after wheat. Global rice production was 596.5 million tons from 155 million hectares (ha) in 1999. The major rice growing regions are found in more than a hundred countries in Asia, Latin America, and Africa. But major rice exporting countries only include Thailand, the United States, Vietnam, Pakistan, and India. About 85 percent of total rice production is for human consumption. Rice provides 23 percent of the global human per capita energy and 16 percent of the per capita protein (IRRI, 1997). In Asia, where people typically eat rice two or three times a day, 250 million rice farms (the average rice land per farm is less than 1 ha) produce more than 90 percent of the world's rice. For example, Myanmar consumes 195 kg of rice per capita per year, whereas the average annual rice consumptions in Europe and America are 3 kg and 7 kg, respectively. The three most populous nations, China, India, and Indonesia, are rice-based countries, which together have 2.5 billion people (about half of the current world population). Malaysia is also a rice-based country. The citizens of Malaysia consumed rice everyday. We believe that Malaysia is a great market to start a market in rice dispensers. The invention relates to a rice dispensing system that is used to store and dispense measured quantities of rice at a single pressing of a button.

People who use rice are required to measure out a selected quantity using a measuring cup or the like and then add the measured quantity of rice to an awaiting pot of boiling water. The rice is normally stored in a cupboard or pantry that will require a person to retrieve the rice when needed. The person then needs to locate a measuring cup to measure the required amount of rice needed.

The present invention can be positioned directly on a kitchen counter adjacent to a stove so that a person can easily retrieve a requisite amount of rice when needed without having to retrieve a box or rice or locate a measuring cup.

While these units may be suitable for the particular purpose employed, or for general use, they would not be as suitable for the purposes of the present invention as disclosed hereafter. A rice dispenser is an object of the invention to produce a housing having a generally rectangular configuration. The housing has an open upper end, an open lower end, a front wall, a back wall, and opposed side walls. The open upper end has a lid hingedly coupled thereto.

The lid seals the open upper end in a closed orientation. The housing includes an L-shaped support stand extending downwardly therefrom. The support stand includes a vertical segment extending downwardly from the back wall. The support stand includes a horizontal segment extending forwardly from a lower edge of the vertical segment. The horizontal segment is positioned below the open lower end of the housing. The housing has a tapered compartment disposed within the open upper end. The tapered compartment has an open lower end. The tapered compartment holds a quantity of rice therein. The housing has a dispensing funnel disposed within the open lower end thereof. The dispensing funnel has an open upper end and an open lower end. A conveyor system is disposed within the housing disposed below the tapered compartment. The conveyor system serves to deliver rice from the tapered compartment to the dispensing funnel. The conveyor system includes a continuous loop belt disposed around a pair of spaced apart rotatable sprockets. The belt has a plurality of spaced apart lips extending upwardly therefrom. The conveyor system includes a motor coupled with one of the sprockets. A timer system is in communication with the conveyor system. The timer system controls the activation of the motor of the conveyor system for predetermined lengths of time. The timer system includes a plurality of activation buttons disposed in the front wall of the housing. Each of the buttons activates the motor at predetermined intervals corresponding with a selected quantity of rice to be dispensed into the dispensing funnel.

To the accomplishment of the above and related objects the invention may be embodied in the form illustrated in the accompanying drawings. Attention is called to the fact, however, that the drawings are illustrative only. Variations are contemplated as being part of the invention, limited only by the scope of the claims.

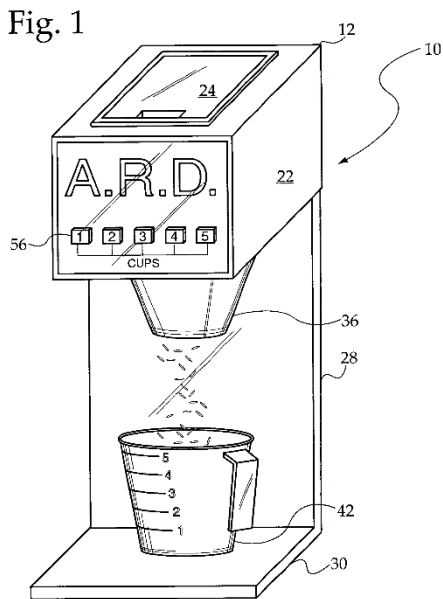


Fig. 1

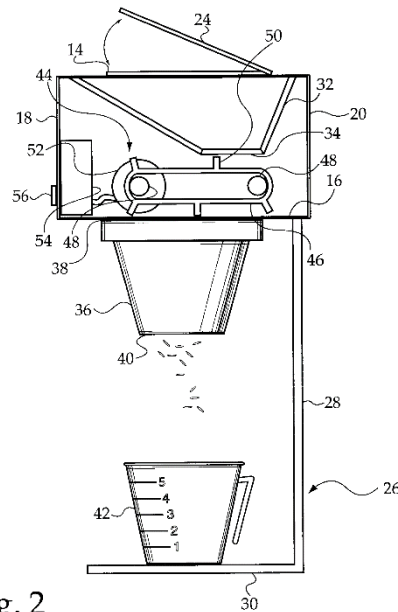


Fig. 2

Today ,there are some Japanese company that is making electronic rice dispenser for the people. One of them is Fujiseiki. Fujiseiki was founded in 1962 and developed Japan’s first rice-ball making machine in 1970. Since that time Fujiseiki has continually strived to develop and popularise numerous food-processing devices such as robots for making packed lunches and sushi,noodle machines, and hot rice dispensers.

Over the past 40 years Fujiseiki has conducted business with over 10,000 businesses and stores while developing over 150 machines, of which 70 are currently being offered for purchase.

Since its founding, Fujiseiki has focused on using advanced technology in its food-processing machines to meet the professional needs of the Japanese market. Recently, however, Fujiseiki machines have become popular in the professional kitchens of other parts of the world, including Asia, Europe, North America, and Oceania, thus contributing greatly to the globalization of Japanese cuisine.Looking ahead, while refining the skills and creative abilities fostered since its founding, Fujiseiki will continue in its pursuit of a new generation of “food culture”.



1.2 PROBLEM STATEMENT

There are countries that is rice based which means that the country main dish is rice. The citizens of that country tend to take rice by using a spoon or a ladle from bowl or straight from the rice cooker. This is not a really efficient way and could lead to a lot of waste. Furthermore, this could also damage the surface of the pot of the rice cooker which bring the need to buy a new rice cooker and rice cookers are quite expensive. Some people leave their rice in the rice cooker to keep them fresh by keeping them warm in the cooker but this method of keeping the rice warm is costly because you need to use electricity to keep them under temperature.

Some countries serve rice in events like weddings, feast and festivals. In Malaysia, the citizens serve rice based meals in weddings and feasts. During events like this, people will come from all over the country and will meet and greet other people thus shaking their hands and touching stuff a lot. One of the things that they will most probably touch is the utensil to scoop rice from the rice containers. people tend to touch the utensil without washing their hands thus distributing germs and other dirty things onto the utensil and onto the rice. This makes the rice become dirty and could spread germs and sickness to everyone.

There are also some companies that uses in their business like chef, caterers and F&B industries like restaurants. These business will be using and distributing huge number of rice every single day and because there are no cheaper machines and not many machines to distribute rice, they have to handle the rice manually and generating a lot of workforce energy in themselves and not to mention the waste of rice that they had to endure in the process. The quality of their rice will not be as good too due to the strain of having to distribute their rice manually and by just using a spoon, this will create rice quality consistency.

We aim to solve all of these problems with just one product that is cheap and effective.

1.3 RESEARCH OBJECTIVE

According to our problem statement, we invent new rice distribution that called ' Rice Verteiler'. This invention can keep cooked rice clean and free from germs that is distributed from people's hands because we don't need to use ladle or spoon anymore to get the rice. This invention also, help people get the right portion of rice according to their needs. People just need spin the rotor and then the rice will fall into the bowl according portion their needs. Furthermore, rice verteiler help people does business using rice to distribute their rice more economically and with less workforce. Besides, temperature retention makes rice not easily stale. This rice verteiler also made from plastic and mechanically design without using electricity to rotate the rotor to make it more affordable for users.

1.4 RESEARCH QUESTION

This study will answer the following research questions:

- i. Is it possible to invent the way to distribute rice in a much more economical and ergonomical manner?
- ii. Is it possible to have a product that can store and distribute food without any electrical equipment?
- iii. What type of material is necessary for food preservation?

1.5 SCOPE OF RESEARCH

The scopes and limits to this research are:

- I. This product can distribute and store food
- II. This product is portable
- III. This product could last for a long time without maintenance
- IV. This product is easy to clean

1.6 SIGNIFICANCE OF RESEARCH

Rice dispenser is already made available in the market especially in Japan but those rice dispensers are electrical operated and cost way over RM1000. We aim to build a manually operated mechanical product that won't cost much and more reliable and easier to maintain. Speaking of maintain, our product will not need to do any maintenance whereas those electric rice dispenser need to be maintained as they are electric operated and complicated. We believe that our product will bring many benefits to the society and also restaurant owners. No more wasting electrical power and money for a rice dispenser.

1.7 DEFINITION OF OPERATIONAL TERMS

Manually Operated : Manual work is work in which you use your hands or your physical strength rather than your mind.

Polythylene : Polyethylene is made from the polymerization of ethylene (or ethene) monomer. Polyethylene chemical formula is $(C_2H_4)_n$.

Dispenser : a machine or container which is designed to release a specific amount of something

1.8 CHAPTER'S SUMMARY

In this chapter, the studies was explained about its origin of ideas and inspirations. All the objectives were made out of all the problem statements. The objective for this project along with the importance of a manually operated rice dispenser that will be cheap, ergonomical and economical causing it to be more convenient to be used, and even the scope of this project only focusing on rice or food preservation. Thus, this rice dispenser could be a new importance in the life off people.

CHAPTER 2

LITERATURE REVIEW

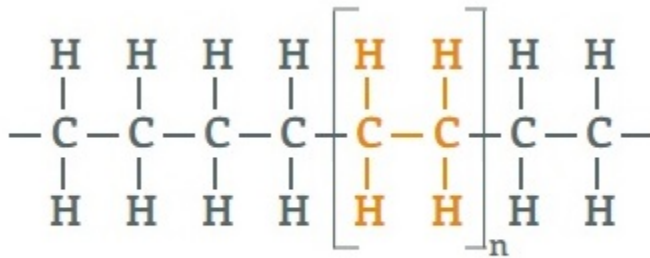
2.1 INTRODUCTION

In this chapter, will be shown three material used in making the rice dispenser. These materials have its own advantages and disadvantages. Hence, all the characteristics of those materials will be compared to our own product which has its own specialties and benefits. For the body of the project we use a polyethylene ice box. These ice boxes are constructed from polyethylene plastic that's further supported by a layer of insulation between the outer coatings. Polyethylene ice boxes are manufactured by using the roto-moulded method, which means the larger parts are formed from one complete piece of polyethylene. Because of this, there are fewer gaps which helps prevent the cold from leaking out and keeps external heat absorption to the minimum. Due to their design, polyethylene ice boxes are considered to be the most energy-efficient choice. As a result, some premium brands like for instance Dometic Waeco can store ice for up to 10 days! For the conveyor on the other hand we wanted to use plastic but instead we use steel. Steel is an alloy of iron and carbon containing less than 2% carbon and 1% manganese and small amounts of silicon, phosphorus, sulphur and oxygen. Steel is the world's most important engineering and construction material. It is used in every aspect of our lives; in cars and construction products, refrigerators and washing machines, cargo ships and surgical scalpels.

2.2 MATERIAL

2.2.1 POLYETHYLENE ICE BOX

CHARACTERISTIC OF POLYETHYLENE



Molecular Structure of Polyethylene

Polyethylene is a lightweight, durable thermoplastic with variable crystalline structure. It is one of the most widely produced plastics in the world (tens of millions of tons are produced worldwide each year). Polyethylene is used in applications ranging for films, tubes, plastic parts, laminates, etc. in several markets (packaging, automotive, electrical, etc.).

Polyethylene is made from the polymerization of ethylene (or ethene) monomer. Polyethylene chemical formula is $(C_2H_4)_n$.

How is PE Made?

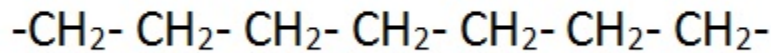
Polyethylene is made by addition or radical polymerization of ethylene (olefin) monomers. (Chemical formula of Ethene - C_2H_4). Ziegler-Natta and Metallocene catalysts are used to carry out polymerization of polyethylene.

High Density Polyethylene (HDPE)

High Density Polyethylene (HDPE) is a cost-effective thermoplastic with linear structure and no or low degree of branching. It is manufactured at low temperature (70-300°C) and pressure (10-80 bar) & derived from either:

- Modifying natural gas (a methane, ethane, propane mix) or
- The catalytic cracking of crude oil into gasoline

HDPE is produced majorly using two techniques: Slurry Polymerization or Gas Phase Polymerization.



High Density Polyethylene Molecular Structure

High density polyethylene is flexible, translucent/waxy, weather resistant, and displays toughness at very low temperatures.

Properties of High Density Polyethylene

1. HDPE Melting point: 120-140°C
2. Density of HDPE: 0.93 to 0.97 g/cm³
3. High Density Polyethylene Chemical resistance:
 - Excellent resistance to most solvents
 - Very good resistance to alcohols, dilute acids and alkalis
 - Moderate resistance to oils and greases
 - Poor resistance to hydrocarbons (aliphatic, aromatic, halogenated)
4. Continuous temperature: -50°C to +60°C, Relatively stiff material with useful temperature capabilities
5. Higher tensile strength compared to other forms of polyethylene
6. Low cost polymer with good processability
7. Good low temperature resistance
8. Excellent electrical insulating properties
9. Very low water absorption
10. FDA compliant

» Learn More About HDPE Properties and Related Values in Detail

Disadvantages of HDPE

- Susceptible to stress cracking
- Lower **stiffness** than polypropylene
- High mold shrinkage
- Poor UV- and low heat resistance
- High-frequency welding and joining impossible

However, weathering resistance of HDPE can be improved by the addition of carbon black or UV absorbing additives. Carbon black also helps to reinforce the material.

2.2.2 STEEL CONVEYOR BELT

Steel is an alloy of iron and carbon containing less than 2% carbon and 1% manganese and small amounts of silicon, phosphorus, sulphur and oxygen. Steel is the world's most important engineering and construction material. It is used in every aspect of our lives; in cars and construction products, refrigerators and washing machines, cargo ships and surgical scalpels.

How its made

Steel is produced via two main routes: the blast furnace-basic oxygen furnace (BF-BOF) route and electric arc furnace (EAF) route. Variations and combinations of production routes also exist.

The key difference between the routes is the type of raw materials they consume. For the BF-BOF route these are predominantly iron ore, coal, and recycled steel, while the EAF route produces steel using mainly recycled steel and electricity. Depending on the plant configuration and availability of recycled steel, other sources of metallic iron such as direct-reduced iron (DRI) or hot metal can also be used in the EAF route.

A total of 70.7% of steel is produced using the BF-BOF route. First, iron ores are reduced to iron, also called hot metal or pig iron. Then the iron is converted to steel in the BOF. After casting and rolling, the steel is delivered as coil, plate, sections or bars.

Most steel products remain in use for decades before they can be recycled. Therefore, there is not enough recycled steel to meet growing demand using the EAF steelmaking method alone. Demand is met through a combined use of the BF-BOF and EAF production methods.

All of these production methods can use recycled steel scrap as an input. Most new steel contains recycled steel.

2.2.3 WOODEN BLOCKS

The wooden blocks are just some wooden apparatus to fill in the gaps surrounding the product.

Yes, wood is porous, and it may draw in liquids and oils from the food you're cooking. However, one study found that those liquids and any bacteria hiding in them do not return to the surface once they're wicked into the wood's cells. Those bacteria also do not multiply and eventually die.

2.3 METHOD

This method selection process is important so that the method choose is accurate and suitable for the product. This method selection will avoid money-lost and time taking processes. Hence, it is important to carry out this method selection process. There are three methods that could be carried out:

1) TURNING

place a plate below the output hole and turn the handle bar at the front of the rice dispenser for the rice to move from the container to the plate. The rice is pushed by the screw conveyer

2.4 MATERIAL SELECTION

The process of material selection is one of the most important process in this final year project. The main factor of material selection is to discuss and finalized which materials that will be use in the project in order to avoid wasting of money and time. The material selection need to be done precisely so that the risks could be avoided.

1) Polythylyne

Polyethylene is a lightweight, durable thermoplastic with variable crystalline structure. It is one of the most widely produced plastics in the world (tens of millions of tons are produced worldwide each year). Polyethylene is used in applications ranging for films, tubes, plastic parts, laminates, etc. in several markets (packaging, automotive, electrical, etc.).

2) Steel

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3) Wooden Blocks

We use some wooden blocks to fill in the gaps and to support the rice vertailer as it was an easier and cheaper solution. The wooden blocks we use are just some normal blocks and we can take it out anytime we want for easier cleaning process.

2.5 CHAPTER'S SUMMARY

As to conclude this chapter, literature review is important to showcase all the studies of materials and methods to enhance the knowledge on this project. Every thesis and others projects that are related to the rice dispenser is really helpful especially for us to understand it fully.

After a lot of materials and methods were discussed and researches were done, the materials that are the most compatible for our project is polythylene as the main material of the container , steel as the screw conveyer and wooden blocks is place to fill in the gaps due to their characters and advantages, meanwhile the methods that we decided to carry on is Turning method.

CHAPTER 3

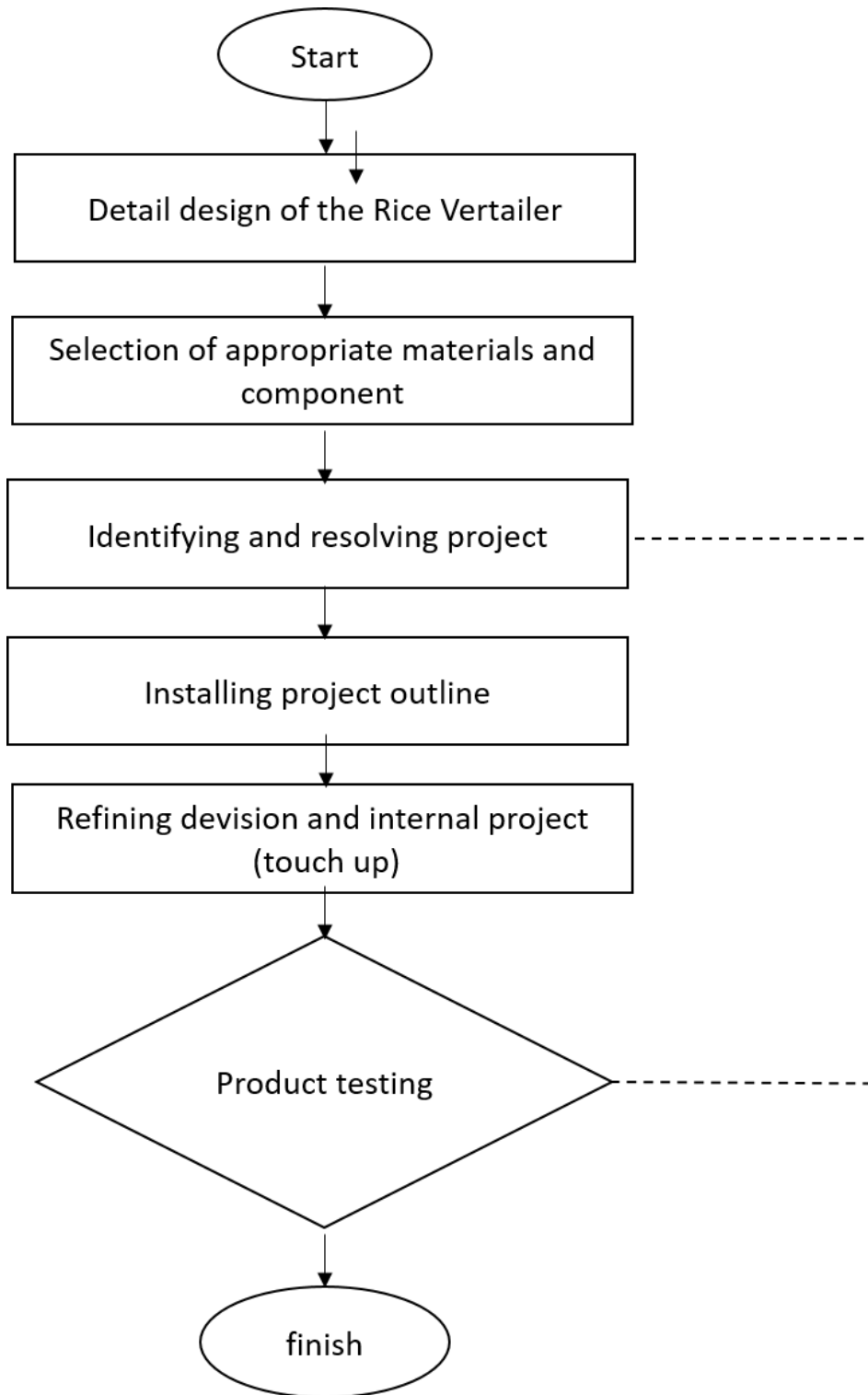
METHODOLOGY

3.1 INTRODUCTION

What is methodology? A methodology is a plan-of-attack, especially when that plan-of-attack is used repeatedly. This might be obvious, but the word methodology is related to the word method. In fact, a methodology is a system of methods followed consistently. Scientists, for example, use various methodologies as they perform experiments. It might seem like the world is nothing but chaos and disorder. But actually, sometimes there is a method to this madness. And sometimes there's a methodology.

In this chapter, there will be a lot of information about the process and journey through out the making of our final project. There will be flow chart showing the process of us making the whole project. This flow chart will explain the processes we took. Next, is the Gantt Chart, which will show the actual and planning throughout all the 13 weeks of our final year project journey. However, in this chapter, we also will show 3 methods we researched to carry our final year project.

3.2 FLOW CHART



3.3 FLOW CHART EXPLANATION

- **Material Selection**

The process of material selection is one of the most important process in this final year project. The main factor of material selection is to discuss and finalized which materials that will be use in the project in order to avoid wasting of money and time. The material selection need to be done precisely so that the risks could be avoided.

4) Polythylyne

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5) Steel

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6) Wooden Blocks

We use some wooden blocks to fill in the gaps and to support the rice vertailer as it was an easier and cheaper solution. The wooden blocks we use are just some normal blocks and we can take it out anytime we want for easier cleaning process.

- **Material Purchase**

The process of materials purchasing is crucial to collect and obtains all the materials needed. In this process a lot of research on the places and suppliers that the materials are going to be purchase is done. This step is important so that the risk of material wasting or money-loss will not happen. However, to carry out material purchasing, a well-made purchasing plan needed to be made. First, the suppliers will be contacted to make sure the availability of the materials. Then, the calculation of the amount of materials needed and also the price of the materials. After that, surveys of price must be carried out to determine the better selling prices. Then finally, the purchases could be made.

- **Method Selection**

This method selection process is important so that the method choose is accurate and suitable for the product. This method selection will avoid money-lost and time taking processes. Hence, it is important to carry out this method selection process. There are three methods that could be carried out:

- 1) TURNING

place a plate below the output hole and turn the handle bar at the front of the rice dispenser for the rice to move from the container to the plate. The rice is pushed by the screw conveyyor

Does the method work

A lot of discussions, researches and experiments were carried out to find the most suitable method to carry out this manually operated rice dispenser. Hence, it is decided to use the turning process. This is because, the turning method requires seem to be the easiest mechanical way that we can think of to dispense the rice economically and ergonomically efficient.

- **Test Run**

Test run is carried out to determine the strength and end result of the product . In this test run , Rice dispenser is tested to determine the strength, stiffness, ergonomics and efficiency .we tried accidentally drop the project and it sustained the impact with little to no damage. We also tried dispensing the rice ourselves and the project worked greatly though it might need a little bit more tweaking to make it better.

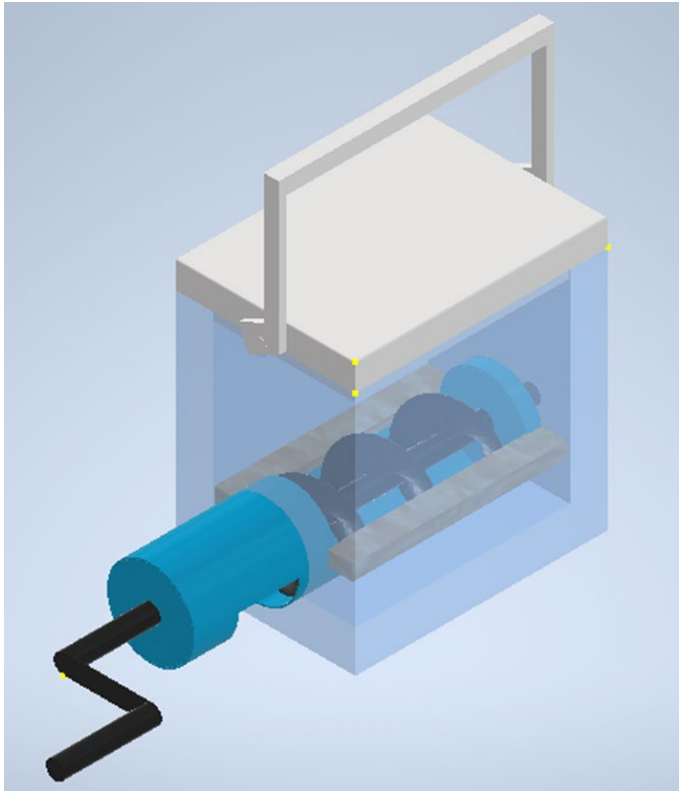
- **Analysis Data**

The process of evaluating data using analytical and logical reasoning to examine each component of data provided. This form of analysis is just one of the many steps that must be completed when conducting a research experiment. Data from the test run is gathered, reviewed and the analysed to form findings, discussions and conclusion. In this project the data collection is collected from the tensile strength of the material we created.

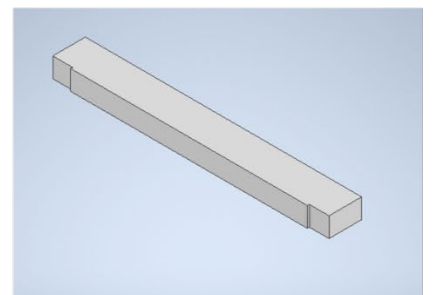
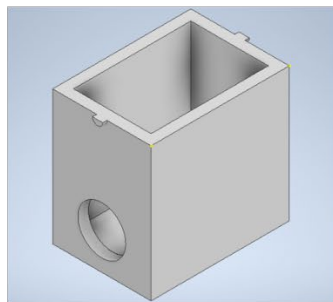
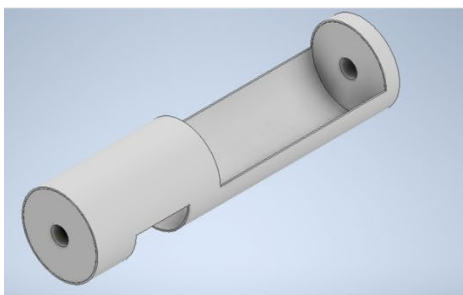
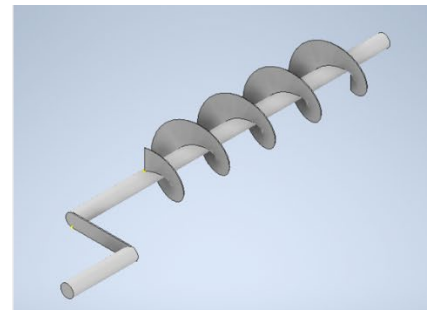
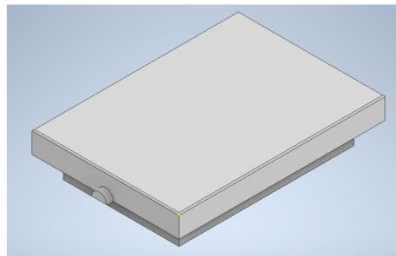
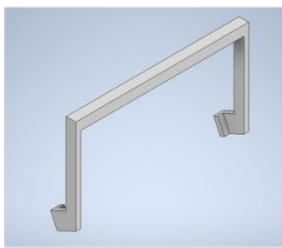
- **Report Writing**

Report writing is one of the most crucial step in every project invented. It is important to make a report based on the project, test run and analysis so that future improvements nor expansion of knowledge could be done. Our report writing is based on the analysis and findings that we collected throughout this whole process of completing this project.

3.4 PRODUCT DESIGN

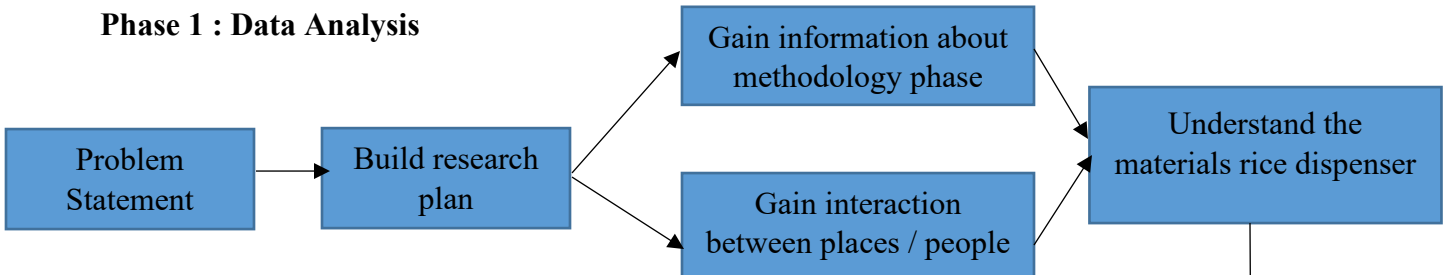


3.5 PARTS DESIGN

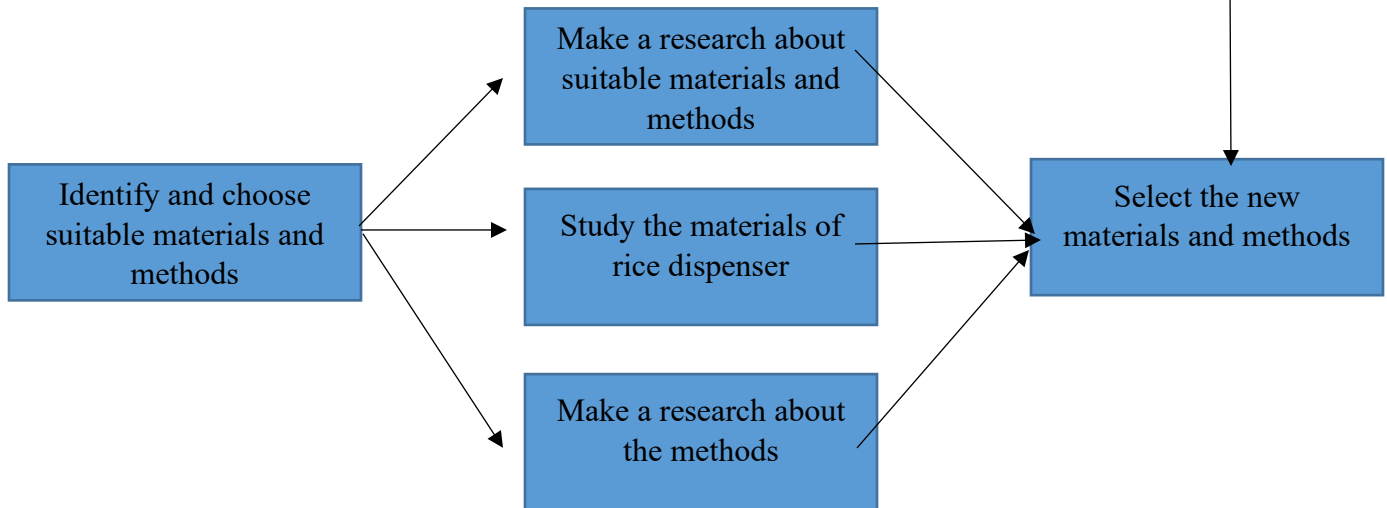


3.6 METHODOLOGY PHASE

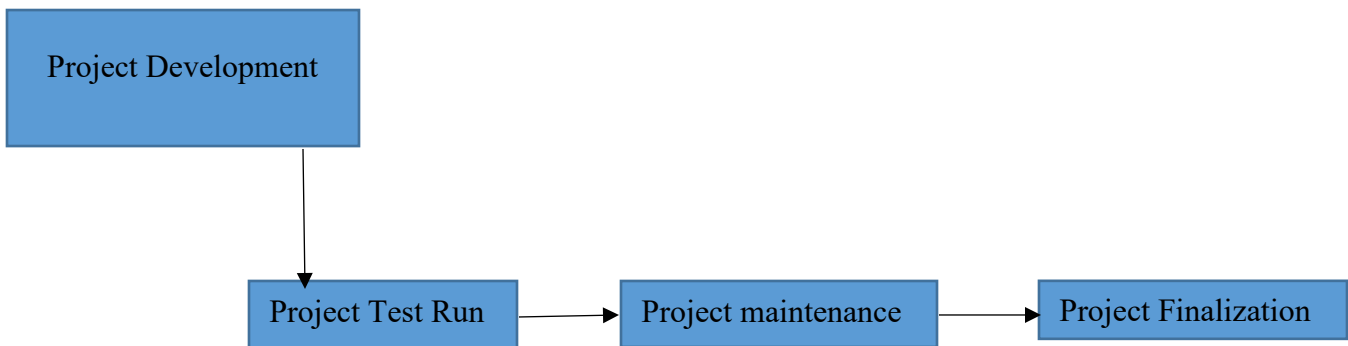
Phase 1 : Data Analysis



Phase 2 : Method and Material



Phase 3 : Preliminary Study



3.7 BUDGET CALCULATION

parts	Price
Ice box	RM90
Drill coil	RM58.41+ RM13(SHIPPING)
Pvc pipe	RM 4
Other accesories	RM 5
TOTAL	RM170.41

Table 3.7.1

3.8 PROJECT ACTIVITY

project Activity	weeks													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Briefing and Project Planning	Green													
	Red													
Project Design		Green												
		Red												
Material Selection			Green											
			Red											
Materials Purchase				Green										
				Red										
Method Selection					Green									
					Red									
Fabrication						Green	Green	Green						
						Red	Red	Red						
Test Run									Green					
									Red					
Analysis Data										Green				
										Red				
Report Writing											Green			
											Red			
Video and Slide making												Green		
												Red		
PITEX preparations													Green	
													Red	
PITEX presentation														Green
														Red

Table 3.8.1



3.9 SUMMARY

As a conclusion, the methods implemented in this project are very crucial and important to complete the project. Thus, as stated in the interview, this project is agreed and accepted by Mr Zulkarnain Bin Hamid, our supervisor. The materials used in the project will create an economical and ergonomical manually operated rice dispenser, hence this project is very convenient to the society and help reduce financial cost. However, this method will affect the result totally if one of the method is change.

CHAPTER 4

FINDINGS AND ANALYSIS

4.1 INTRODUCTION

This chapter combine data and analysis of the manually operated rice dispenser. This data and analysis are very important for this project to achieve the objectives and scope of the project. This data indicates the successful results of the materials testing. After getting all of this data, we analyze every single possible to make it perfect.

4.2 ADVANTAGE AND DISADVANTAGE

Every project has its own pros and cons, the pros will help the people and also the environment. However, the cons or the disadvantages must be improved or change for the future so that we could enhance the good and very efficient product that hardly to find disadvantage of the project.

4.2.1 Advantages

- more cheaper
- no expensive
- save electric
- can keep cooked rice warm without using electricity
- Portable
light and easy to carry
 - easy to use
- users can easily learn how to use the item

4.2.2 DISSADVANTAGE

Big size

-not compatible with all types of house

No sensors

-there are no sensors to detect that remaining quantity of the rice vertailer

Struggle to clean

-cleaning the products is quite difficult

Manual rotation

-we purposely made the rice vertailer to be manually operated but this interest might differ from some people as it is could be harder to use for some people.

4.3 BENEFITS

Every innovation has its own benefits. So this rice verteiler could easily dispense our rice without spilling them or giving a hard time to scoop the rice using spoon or ladle. You can walk over to the rice verteiler and simply turn the turner to access the amount of rice that you wanted. Besides, rice verteiler can help restaurants and caterers that serve rice huge number of rice every single day use less workforce and also can prevent germs and insects that attached at people hands from touching the cooked rice. This rice verteiler is low cost product so people with small business can buy it too. Furthermore, this product eco-friendly because only use mechanical energy without electricity to make it work. For our nation, this rice verteiler can inhibit the spread germs and virus like Covid-19 to other people through germs and virus that distributed from people's hands.

4.4 CHAPTER'S SUMMARY

As a conclusion for this chapter , the analysis and findings have been made. This rice dispenser has a lot of advantages and some disadvantages . Hence, the challenges are taken as a room for improvements and more developments for future generation and well as to enhance their knowledge on the project we carried out. Test run is carried out to determine the fullest potential of the polythythlene rice dispense

CHAPTER 5

DISCUSSION , CONCLUSION AND UPGRADE PLAN

5.1 INTRODUCTION

This chapter explains about discussion , conclusion and upgrade plan all together for the project . From the data from the test run of the project, the analysis have been done. Hence, the discussion from all the results of test run and analysis will be explain in this chapter. Then , the conclusion will be made based on the discussion and upgrade plan that have been made.

5.2 DISCUSSION

Based on the data we collected , we can agree to the fact that we need to improve food distribution because the current process of serving and distributing food are not really economical and hygienic. The process became harmful especially with the current covid-19 virus situation. . However , if we are able to revolutionize food distribution with minimal human contacts, this could help preserve food hygiene and make situations safer.

Our original idea was to use a slightly different design and method of use but because of some time limitations and the covid-19 pandemic, it was hard for us to look for resources and for us to get together and build our project so we had to use a much safer approach.

Other than that, the material of the screw conveyor need to be researched and improve because it is too heavy for our liking. We wanted to use plastic using 3d printing but our friend who is an expert at 3D printing warn us to not do it because of the heat generated from the rice could cause problems with the screw conveyor. we believe it would be great to have a material that can use be use using a 3D printer that is light, durable and environmental friendly.

Furthermore, to make the rice vertailer more ergonomic, we can improve the method of use of this product. Instead of just turning, we could make it slightly electrical by just using something like a double A battery as power source. This could make the method of use abit more easier when trying to use the rice vertailer.

CONCLUSION

As the conclusion, the invention of this project is to boost personal food hygiene and to increase the quality of our food with a much more simple and easy solution. according to our research, the invention of our product is very important nowadays because there is a global pandemic from the spread of the covid-19 virus which is a very harmful virus that have caused million of death worldwide and it is still going strong. we aim to aid and help business owners that works in the F&B industry especially to businesses that distribute grain type of food to reduce the possibility of contracting the virus thus prevent business lockdowns. we also aim to reduce the possibility of contracting the virus in households coming from the family members. we hope to shape a new healthier lifestyle in the world for the future generations to come.

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ATTACHMENT





